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(54) Title: SCHEME FOR VALIDATING INSTANT GAMING TICKETS

(57) Abstract: An apparatus and method for validating an instant ticket for playing a game is disclosed. The ticket has printed thereon validation data and game indicia, the game indicia being covered by an opaque, removable coating and a portion of the game indicia being uncovered in accordance with a game rule to play the game. The instant ticket is read to determine the validation data and the relative positions of the uncovered game indicia on the instant ticket. Game data relating to the instant ticket is obtained from a location other than the instant ticket. A virtual ticket corresponding to the instant ticket is created based on the validation data and the game data. The virtual ticket is compared to the instant ticket to determine whether a winning combination of game indicia is uncovered on the instant ticket in accordance with the game rule. An apparatus and method for producing such an instant ticket is also disclosed.

Scheme for Validating Instant Gaming Tickets

TECHNICAL FIELD

This invention relates to instant gaming tickets, and more particularly to validating instant gaming tickets, e.g., for playing a probability game, by creating corresponding virtual tickets to compare to the actual tickets.

BACKGROUND

An instant gaming ticket typically includes a substrate or card having a play area in which game indicia, e.g., numbers, are printed. The play area is usually divided into a number of discrete choice boxes, each choice box containing one of the game indicia. Each choice box is covered with an opaque, removable coating, such as a scratch-off latex coating, to prevent a player from seeing the game indicia prior to scratching off the coating.

Play of an instant gaming ticket for a probability game requires a player to scratch off the coating from only some of choice boxes in the play area to reveal a set of the game indicia which may comprise a winning combination of game indicia. For example, a probability game may require the player to scratch off the coating from four out of twenty choice boxes to attempt to uncover a winning combination of game indicia. There is a predetermined probability that any group of choice boxes uncovered by the player will produce a winning combination. For such a probability game, a single ticket may have multiple winning combinations of game indicia, and any of the game indicia can be included in one or more of the winning combinations. Moreover, every ticket is potentially a winning ticket.

Instant gaming tickets also typically include a machine-readable barcode printed on the substrate or card. The barcode may contain various types of gaming information, including validation data and winning data. The validation data include information used to redeem the instant gaming ticket, including an identification of the vendor of the ticket, the game number, the number of the batch from which the ticket was obtained, and any other data deemed pertinent by the gaming authority that

administers the game. The winning data pertain to the locations of choice boxes in the play area which comprise winning combinations of game indicia.

If a player believes that he or she has uncovered a winning combination of game indicia on an instant gaming ticket, the ticket may be redeemed using a validation system administered by the gaming authority. The validation system may involve reading information from the instant ticket using an instant ticket reader capable of interpreting the information contained in the barcode and determining which choice boxes in the game area have been uncovered by the player. The information obtained by the instant ticket reader may be transmitted, e.g. over a network, to a remote location to validate the ticket, i.e. to determine whether a winning combination of game indicia has been uncovered on the ticket.

For instant games other than probability games, only a fraction, e.g., 20%, of the tickets sold to players are winning tickets. For such games, a validation system that validates' , the ticket using, e.g., an on-line instant gaming terminal, maintains a record for each winning game ticket that replicates the game indicia as printed in the choice boxes in the play area of the card.

Instant gaming tickets used to play probability games must be secure against tampering and fraudulent use, since the tickets as presented to the players contain all of the winning combinations of game indicia. For an instant probability game ticket, an unscrupulous player may attempt to determine which choice boxes must be uncovered to obtain a winning combination of game indicia on the basis of data contained in the barcode or information obtained from another source associated with the gaming authority. A gaming system that validates winning instant tickets requires a mechanism for ensuring that the validation information and winning information associated with the tickets is secure and cannot be used to determine which choice boxes contain winning combinations of game indicia without scratching off the latex coating from the choice boxes.

SUMMARY

In general, in one aspect, the invention features a method of validating an instant ticket for playing a game, the ticket having printed thereon validation data and game indicia, the game indicia being covered by an opaque, removable coating and a portion of the game indicia being uncovered in accordance with a game rule to play

the game. The instant ticket is read to determine the validation data and the relative positions of the uncovered game indicia on the instant ticket. Game data relating to the instant ticket is obtained from a location other than the instant ticket. A virtual ticket corresponding to the instant ticket is created based on the validation data and the game data. The virtual ticket is compared to the instant ticket to determine whether a winning combination of game indicia is uncovered on the instant ticket in accordance with the game rule.

Implementations of the invention may also include one or more of the following features. The method may include providing an indication that the instant ticket includes a winning combination of game indicia.

The virtual ticket may have a byte map format. The validation data may be printed on the instant ticket in a machine-readable format. The validation data may include a ticket -validation parameter. The ticket validation parameter may be printed on the instant ticket ink. an encrypted format, the ticket validation parameter being decrypted prior to creating the virtual ticket.

The game data may be obtained from a location remote from the instant ticket. The method may include storing the game data at a remote location. The method may also include transmitting the validation data and the locations of the uncovered game indicia on the instant ticket to the remote location prior to creating the virtual ticket. The validation data and the locations of the uncovered game indicia on the instant ticket may be transmitted over a network.

The game information may include game parameters indicative of the game rule and game seeds for generating a pattern of game indicia corresponding to the relative positions of the game indicia printed on the instant ticket. The game seeds may be stored in an encrypted format, the game seeds being decrypted prior to creating the virtual ticket.

In general, in another aspect, the invention features a method of producing an instant ticket for playing a game, the game being played by uncovering a portion of game indicia printed on the instant ticket in accordance with a game rule. Ticket data relating to the instant ticket and game parameters indicative of the game rule are provided. A ticket validation parameter is calculated based on the ticket data and the game parameters. Game seeds to generate a random selection of game indicia for the instant ticket are provided. A pattern of game indicia indicative of the relative

positions of the game indicia for the instant ticket are calculated based on the ticket data, the game parameters, the ticket validation parameter, and the game seeds. The ticket validation parameter and the game indicia are printed on the instant ticket in accordance with the pattern of game indicia.

Implementations of the invention may also include one or more of the following features. The method may include disposing an opaque, removable coating on the game indicia. The ticket validation parameter is printed on the instant ticket in a machine-readable format.

The method may include printing the ticket data on the ticket. The method may include encrypting the ticket validation parameter prior to printing the ticket validation
parameter on the instant ticket.

The method may include storing the game parameters and the game seeds, and the game seeds may be encrypted prior to storing the game parameters and the game seeds. The method may also include transmitting the game parameters and the game seeds to a remote location, and the game parameters and the game seeds may be transmitted over a network.

In general, in another aspect, the invention features an apparatus for validating an instant ticket for playing a game, the ticket having printed thereon validation data and game indicia, the game indicia being covered by an opaque, removable coating and a portion of the game indicia being uncovered in accordance with a game rule to play the game. A ticket reader is capable of reading the instant ticket to determine the validation data and the relative positions of the uncovered game indicia on the instant ticket. A host validation system creates a virtual ticket corresponding to the instant ticket based on the validation data and game data stored at the host validation system, the host validation system further comparing the virtual ticket to the instant ticket to determine whether a winning combination of game indicia is uncovered on the instant ticket in accordance with the game rule.

In general, in another aspect, the invention features an apparatus for producing an instant ticket for playing a game, the game being played by uncovering a portion of game indicia printed on the instant ticket in accordance with a game rule. A gaming authority provides ticket data relating to the instant ticket and game parameters indicative of the game rule. A processor is capable of calculating a ticket validation

parameter based on the ticket data and the game parameters; using game seeds to generate a random selection of game indicia for the instant ticket; and calculating a pattern of game indicia indicative of the relative positions of the game indicia for the instant ticket based on the ticket data, the game parameters, the ticket validation parameter, and the game seeds. A printer prints on the instant ticket the ticket validation parameter and the game indicia in accordance with the pattern of game indicia.

The present invention has the advantage of reducing the storage and computing requirements of a validation system for instant gaming tickets used to play, e.g., probability games.

The present invention has the further advantage of enhancing the security of instant gaming tickets.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

FIG. 1 shows an instant gaming ticket according to the present invention.

FIG. 2 is a diagrammatic sketch of a gaming system for printing and validating instant gaming tickets according to the present invention.

FIG. 3 is a diagrammatic sketch of a system for printing an authentication feature on an instant gaming ticket according to the present invention.

FIG. 4 is a diagrammatic sketch of a system for authenticating the instant game ticket as printed according to FIG. 3.

FIG. 5 is a diagrammatic sketch of a system for printing an instant gaming ticket according to the present invention.

FIG. 6 is a diagrammatic sketch of a system for validating the instant gaming ticket as printed according to FIG. 5.

FIGS. 7A and 7B are a flow chart showing a method of printing an instant gaming ticket using the system of FIG. 2.

FIGS. 8A and 8B are a flow chart showing a method of validating an instant gaming ticket using the system of FIG. 2.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

The present invention relates to validating and authenticating an instant gaming ticket used to play, e.g., a probability game, to determine the winning status of the ticket and to determine whether or not a prize should be paid to a player presenting the ticket for redemption. An algorithm is used during authentication and validation procedures associated with ticket redemption to create a virtual ticket, which is an electronic, virtual replica of the physical instant gaming ticket. The virtual ticket replicates the ticket as it was produced, including a map of the locations of the game indicia in the choice boxes of the play area of the ticket and the ticket specific security signatures. Creation of a virtual ticket upon redemption of an instant gaming ticket eliminates the need to store, maintain and access "winning" files for redeeming winning instant gaming tickets. Since every instant gaming ticket used to play a probability game is potentially a winning ticket, maintaining a winning record or file for each ticket would present a substantial burden to the gaming authority administering the game.

Authentication relates to determining that the instant gaming ticket was properly produced and played by the player, i.e., that the ticket was not altered or tampered with in a fraudulent manner. Validation concerns determining whether the instant gaming ticket as played by a player is a winning ticket that entitles the player to receive a prize.

An instant game played with an instant gaming ticket may be represented by one or more game instances. A game instance is defined as a two-dimensional N x M matrix of game indicia, where N and M are positive integers indicating the numbers of rows and columns; respectively, in the matrix. The rows and columns need not be linear, and the matrix may be represented as any shape, e.g., a series of semicircular patterns of game indicia.

Every game instance has associated play rules governing how to play the game, e.g., scratching off the latex coating from only one choice box in each row. Thus, the play rules are associated with the particular game instance and the rows and columns of the N x M matrix.

A player wins a game instance if he or she scratches off the latex coating from choice boxes in the play area to uncover a winning combination of game indicia according to a set of win rules. The win rules may be used to define the interaction of matches between the uncovered choice boxes on the actual ticket and the re-created virtual ticket used to validate the ticket. Thus, the win rules for each game instance are used to make the comparison between the actual ticket and the virtual ticket.

For example, a ticket may have 25 choice boxes in the play area arranged as a 5 x 5 square matrix, as follows:

B	A	C	D	E
F	G	H	I	J
K	L	M	A	N
O	P	Q	R	S
T	U	A	V	W

A player may scratch off the latex coating to uncover up to five choice boxes in the play area of the ticket. In this example, the play symbols are letters of the alphabet; however, the play indicia may be any type of symbol, e.g., playing cards or fruit.

If the letter A is chosen to be a "winning" game symbol, the game indicia on the ticket may be represented virtually as a linear string byte map, as follows:

01000 00000 00010 00000 00100

In this example, "1" represents the letter "A", "0" represents all other letters, and each of the rows is represented consecutively in the linear string.

In this example, each of the choice boxes may be regarded as belonging to one game instance. By using a byte map to represent the ticket virtually, up to 255 different winning symbols may be represented on the ticket for each game instance.

The win rules for the game instances define the corresponding bytes) of the virtual ticket that the game indicia on the ticket must match for a prize to be awarded. The win rules for the game instances of this example may require a player to uncover choice boxes containing the letter "A". The prize paid to a winning ticket will depend on the number of A's that are uncovered, with the prize increasing as the number of uncovered A's increases.

By adding other winning bytes to the virtual ticket, e.g., the number " 2", there may be additional winning combinations of game indicia for a single game instance,

as long as the win rules specify how the game is played to win a prize. For example, a poker scratch off game may pay out $2 for each pair of matching cards and S5 for three of a kind, with respect to uncovered game indicia in the choice boxes on the ticket.

If another choice box is added to a ticket, e.g., having the form of a "double or nothing" payout space that would allow the player to either double or lose his or her prize by scratching off the latex from the choice box, such a single choice box could constitute another game instance of an array having one row and one column, i.e., N=1 and M=1. For this example, a virtual ticket would require only one additional byte to represent this game instance.

An instant game played with an instant gaming ticket may further take the form of one or more game classes. A game class is a generic definition of a game that determines how winning game tickets are validated. A preferred game class involves game instances for which the status of a ticket as a winning ticket may be determined using a byte map. In such .a byte map, each byte represents one choice box in the play area of the ticket, and the bytes are stored and recorded consecutively, as shown in the following example:

First game instance, First choice box
First game instance, Second choice box
. . .
Second game instance, First choice box
Second game instance, Second choice box
. . .

In the preferred game class, the virtual ticket created to validate the ticket is a byte map in- the form of a character string in which each byte represents a choice box, each of the characters being arranged in order to have the same byte map format as the actual ticket.

In the preferred game class, there may be multiple winning combinations of game indicia on any instant gaming ticket, but the game indicia in any one choice box can only be included in one winning combination, i.e., the game cannot win differently with the same choice box or boxes uncovered by the player.

Game seeds GS are the seeds used to generate the game indicia, e.g., numbers, selected from the universe of game indicia to construct an instant gaming ticket. Game seeds GS are used, e.g., with a random generator, to produce varying combinations of game indicia so that each instant gaming ticket has a unique combination of game indicia. Game parameters GP are the game rules under which game indicia may be combined to form winning combinations on an instant gaming ticket. For example, the game parameters for an instant game may require that winning combinations of game indicia are sets of identical game indicia uncovered in the play area of the instant gaming ticket.

Information about the instant game and the ticket itself may be used in a scheme for validating and authenticating an instant ticket. Such information may include a game number GN, a site number SN corresponding to the location from which the ticket was sold to the player, a pack number PN indicative of the pack of batch from which the ticket was selected, and a ticket number TN.

FIG. 1 shows an instant gaming ticket 11. Ticket 11 includes a substrate or card 12. Substrate 12 may be printed with a play area 22, a barcode 24 or other machine-readable code, and ornamental features 26. Play area 22 may be an array of choice boxes 30, each of which includes game indicia 32 for playing the game and is covered by an opaque, removable coating 34, e.g., a scratch-off latex coating. Game indicia 32 may be, e.g., numbers, symbols or words, depending on the type of instant gaming being played.

As shown in FIG. 2, a gaming system 50 includes a gaming authority 52, an instant gaming ticket printer 54, an instant ticket validator 56 at a retail location 58, and a host validation system 60. Host validation 60 may be a part gaming authority 52, or it may be an independent organization.

The components of gaming system 50 may communicate with each over a network 70. Network 70 is preferably a secure, private, digital network. Network 70 may also be the Internet or any electronic communications network such as a dial-up, hard-wired or wireless digital network.

Gaming authority 52 controls the operation of all of the components of gaming system 50, including the printing and validation of instant gaming tickets. Gaming authority 52 may be located at a remote location in communication with the other components of gaming system 50 over network 70, or may be at the same location as

instant gaming ticket printer 54. Gaming authority 52 preferably includes a processor 72, a memory 73, and a modem 74 or other network communications device for communicating with the components of gaming system 50 over network 70.

Instant gaming ticket printer 54 is any entity capable of printing and producing instant gaming tickets. To work in conjunction with gaming system 50, instant gaming ticket printer 54 preferably includes a processor 64, a memory 66, and a modem 68, in addition to ticket printing equipment (not shown). Printer 54 also preferably includes a random generator 80 used in conjunction with game seeds GS to print game indicia in the choice boxes on the instant gaming tickets.

Instant ticket validator 56 may be located at a retail location 58, at which players purchase and redeem instant gaming tickets used to play an instant game such as a probability game. There may be two or more such instant ticket validators located at geographically remote retail locations, all of which may communicate with the components of gaming system 50, e.g., over network 70. Instant ticket validator 56 preferably includes an instant ticket reader 42 capable of reading machine-readable barcode 24 and determining which choice boxes 30 in play area 22 are uncovered and which remain covered. Alternatively, instant ticket reader 42 may be a separate device from validator 56, but in communication with and operating in conjunction with the validator at retail location 58. Instant ticket readers capable of determining the locations of uncovered choice boxes on probability game cards are known, e.g., U.S. Patent Nos. 5,599,046 and 5,475,205. Instant ticket validator 56 also preferably includes a processor 77 and a memory 76, e.g., a magnetic storage device, for processing and storing the information read from ticket 11 by instant ticket reader 42, and a modem 78 for communicating all or a portion of that information to the other components of gaming system 50, e.g., over network 70.

Host validation system 60 preferably includes processor 82, memory 86, and modem 90. Host validation system may be operated, e.g., by a secure game operator or instant ticket service such as GTECH Corporation, West Greenwich, Rhode Island.

Authentication of an instant gaming ticket according to the present invention involves application of an algorithm or function f to generate a ticket security signature TSS. The algorithm is the particular method of calculating and/or manipulating the information input into the algorithm or function to create an output in the form of ticket security signature TSS.

Ticket security signature TSS may be represented as a function of information about the instant gaming ticket and the game, collectively referred to as variable data, including game number GN, site number SN, pack number PN, and ticket number TN, as well as defined game parameters GP. Thus, the ticket security signature may be represented as follows:

$$TSS = f(GN, SN, PN, TN, GP)$$

As shown in FIG. 3, ticket security signature TSS is printed on an instant gaming ticket for subsequent authentication of the ticket. Ticket security signature TSS is generated using algorithm or function f. All of the variable data and game parameters GP are provided by gaming authority 52 to printer 54 to produce the ticket. However, only game parameters GP need to be stored by gaming authority 52 or host validation system 60 for subsequent authentication of the ticket. Printer 54 prints ticket security signature TSS and the variable . data on the instant gaming ticket.

FIG. 4 shows how function f is used to authenticate an instant gaming ticket presented for validation at retail location 58 using validator 56 and instant ticket reader 42. Instant ticket validator 56 or host validation system 60 re-creates ticket security signature TSS for comparison to the ticket security signature read from the ticket by the instant ticket validator. In particular, instant ticket reader 42 reads and converts the machine-readable format printed on the ticket into the read ticket security signature and the variable data. When the instant gaming ticket is presented for redemption, validator 56 transmits a request, e.g., over network 70, to the organization storing game parameters GP associated with the ticket. For example, the game parameters may be associated with ticket number TN and stored in memory 86 of host validation system 60. The game parameters are sent, e.g., over network 70, to validator 56. Alternatively, the game parameters may be transmitted to the validator and stored locally for future use as needed.

Processor 77 in validator 56 carries out algorithm or function f based on the information obtained from host validation system 60 and from the ticket itself to calculate or re-create ticket security signature TSS. If the read ticket security signature and the calculated ticket security signature differ, the ticket is deemed non-authentic and is rejected. If the read ticket security signature and the calculated ticket security signature match, then the ticket is deemed to be authentic, and the ticket is validated

to determine whether the player has uncovered a winning combination of game indicia in the choice boxes 30 of play area 22 on ticket 11.

Host validation system 60 validates an instant gaming ticket according to the present invention by applying an algorithm or function that constructs a virtual ticket corresponding to the ticket printed by printer 54. The algorithm for constructing the virtual ticket uses information input or read from the ticket, e.g., information encoded in machine-readable barcode 24, and information stored at host validation system 60 and provided by printer 54. In particular, the information read from the ticket may include the variable data and a ticket validation parameter TVP. TVP may be calculated using an algorithm or function h, applied to the variable data and game parameters GP, as follows:

$$TVP = h(GN, SN, PN, TN, GP)$$

The ticket validation parameter as printed on the ticket is preferably encrypted to enhance the security of the ticket. The information provided by printer 54 to host gaming validation system 60 includes game seeds GS, which are preferably encrypted to enhance the security of the validation procedure. The encrypted game seeds may be provided to host validation system 60 in the form of machine-readable tapes or a digital file transmitted, e.g.' over network 70. Game parameters GP may be stored in memory 86 of host validation system 60.

As shown in FIG. 5, printer 54 produces an instant gaming ticket by calculating ticket validation parameter TVP using information provided by gaming authority 52 or host validation system 60, namely the variable data and game parameters GP. Printer 54 encrypts ticket validation parameter TVP, converts it into a machine-readable format, e.g., a barcode, and prints the machine-readable format on the ticket within the barcode.

Game seeds GS for seeding random generator 80 are determined by the printer. The printer encrypts the game seeds, and sends the encrypted information to host validation system 60 to be stored in memory 86.

Printer 54 also inputs the game seeds, along with calculated ticket validation parameter TVP, the variable data and game parameters GP, into an algorithm or function i to create a unique indicia choice box pattern CDP. The choice box pattern is the pattern or array of game indicia to be printed in the choice boxes in the play area of the ticket. Choice box pattern CDP may be represented in the following form:

CDP = i(GN, PN, TN, SN, GP, TVP, GS)

Host validation system 60 stores game seeds GS and game parameters GP, until a player that has played the instant game using the instant ticket attempts to redeem the ticket using gaming system 50.

As shown in FIG. 6, when the ticket is redeemed, host validation system 60 creates a virtual ticket corresponding to the actual ticket as produced by printer 54. The virtual ticket is created on the basis of information read from the ticket by instant ticket validator 56 and transmitted to host validation system 60, and information provided by printer 54 and stored at the host validation system.

In particular, host validation system 60 uses an algorithm or function j to construct _ the virtual ticket in the form of a byte map based on the same parameters used to create the. actual ticket (FIG. 5). Instant ticket reader 42 obtains the variable data and the encrypted ticket validation parameter TVP from the machine-readable format printed on the ticket. All of the information read from the card, including the locations of the game indicia in the choice boxes in the play area of the ticket and the ticket validation parameter, are sent to host validation system 60, e.g., over network 70. The host validation system retrieves the stored game parameters GP and encrypted game seeds GS corresponding to the ticket read by the instant ticket reader. The game seeds and ticket validation parameter TVP are decrypted, and all of the information obtained by host validation system 60 is input into function j to calculate or create a virtual ticket in the form of a byte map. Function j may be represented as follows:

Virtual Ticket = j(GN, SN, PN, TN, TVP, GP, GS)

Host validation system 60 compares the virtual ticket with the actual game indicia in the choice boxes in play area of the instant gaming ticket to determine whether the ticket was been played in a manner that results in a winning ticket. The virtual ticket and the actual ticket preferably are both represented as byte maps for purposes of making this comparison.

FIGS. 7A and 7B are a flow chart showing a method 300 of producing instant gaming tickets such as ticket 11. Gaming authority 52 provides instant gaming ticket printer 54 with gaming information for each ticket, such as the variable data including game number GN, site number SN, pack number PN and ticket number TN, and game parameters GP (step 310).

For each ticket, printer 54 calculates ticket validation parameter TVP using algorithm or function h applied to the variable data and game parameters GP (step 320). As originally calculated, ticket validation parameter TVP may be in the form of an alphanumeric string. Printer 54 also generates the game seeds for the game indicia to be printed in the choice boxes in the play area of the ticket (step 330). The printer inputs the game seeds, along with the variable data, game parameters GP, and calculated ticket validation parameter TVP into an algorithm or function i carried out by processor 64 to calculate choice box pattern CBP (step 340).

Printer 54 encrypts ticket validation parameter TVP (step 350), and converts the encrypted ticket validation pattern, along with the variable data, into a machine-readable format, e.g., a barcode 24 (step 360). The printer also determines the locations of game indicia in the choice boxes to be printed in the play area of the ticket based on choice box pattern CBP (step 370). Printer 54 prints barcode 24 and the game indicia on ticket 11 (step 380), and then places the opaque, removable coating over the choice boxes (step 390). The printer stores ticket validation parameter TVP and the game seeds in memory 66 (step 400). Printer 54 also encrypts the game seeds (step 4I0), and transmits the encrypted game seeds to host validation system 60, e.g., over network 70, for storage in memory 86 (step 420). Finally, the printer sends the completed, printed ticket to a retail location, e.g., retail location 58, for purchase by a player (step 430).

FIGS. 8A and 8B are a flow chart showing a method 500 of validating instant gaming ticket 11 using gaming system 50. A player plays ticket 11 by scratching off the appropriate number of choice boxes and determines whether the game indicia in the uncovered choice boxes form a winning combination (step 510). The player brings the ticket to instant ticket validator 56 at retail location 58 for validation (step 520). Instant ticket reader 42 reads machine-readable barcode 24 to obtain the coded information and determines which choices boxes 30 in play area 22 have been uncovered (step 530), and stores this information in memory 76 of the instant ticket validator (step 540). The coded information obtained from the barcode includes the variable data such as game number GN, site number SN, pack number PN, ticket number TN, and ticket validation parameter TVP in an encrypted format.

Processor 77 of validator 56 obtains game parameters GP corresponding to the ticket from host validation system 60 (step 570). Processor 77 inputs the variable data

and game parameters GP into algorithm or function f to calculate the ticket security signature (step 580). If the ticket is deemed authentic by validator 56 based on a comparison of the read and calculated ticket security signatures (step 590), the variable data and encrypted ticket validation parameter TVP, along with the game indicia and their locations in the choice boxes, are transmitted to host validation system 60, e. g., over network 70, and stored in memory 86 (step 600). If the validator determines that the ticket is not authentic, it is rejected (step 595).

Upon receiving the variable data and encrypted ticket validation parameter TVP, processor 82 of the host validation system retrieves game parameters GP and the encrypted game seeds corresponding to the ticket being validated from memory 86 (step 610). Processor 82 decrypts the game seeds and ticket validation parameter (step 620), and inputs game parameters GP and the decrypted game seeds and ticket validation parameter, along with the variable data, into algorithm or function j to create the a virtual ticket in the form of a byte map (step 630). The host validation system may perform the validation algorithm associated with function j in conjunction with another independent validation organization.

Processor 82 compares the game indicia of the virtual ticket with the game indicia in the choice boxes in play area 22, as read from the actual ticket, to determine whether the player uncovered a wining combination of game indicia according to the rules of the game, e.g., that only the correct choice boxes, and optionally, no other choice boxes, were uncovered to form a winning combination of play indicia (step 640). Upon determining that ticket 11 is a valid winning ticket, host validation system 60 transmits a signal to instant ticket validator 56 to indicate to the player validating the ticket at retail location 58 that the ticket is a winning ticket and to indicate to an operator of the instant ticket validator to provide a prize, e.g., a cash award, to the player in exchange for the ticket (step 650).

A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, the invention may involves the use of multiple or alternative definitions of game classes. Further, the invention can be applied to authenticating and validation instant games that are not probability games. Accordingly, other embodiments are within the scope of the following claims.

WHAT IS CLAIMED IS:

1. A method of validating an instant ticket for playing a game, the ticket having printed thereon validation data and game indicia, the game indicia being covered by an opaque, removable coating and a portion of the game indicia being uncovered in accordance with a game rule to play the game, the method comprising:

reading the instant ticket to determine the validation data and the relative positions of the uncovered game indicia on the instant ticket;

obtaining game data relating to the instant ticket from a location other than the instant ticket;

creating a virtual ticket corresponding to the instant ticket based on the validation data and the game data; and

comparing the virtual ticket to the instant ticket to determine whether a winning combination of game indicia is uncovered on the instant ticket in accordance with the game rule.

2. The method of claim 1 further comprising

providing an indication that the instant ticket includes a winning combination of game indicia.

3. The method of claim 1 wherein the virtual ticket has a byte map format.

4. The method of claim 1 wherein the validation data is printed on the instant ticket in a machine-readable format.

5. The method of claim 1 wherein the validation data includes a ticket validation parameter.

6. The method of claim 5 wherein the ticket validation parameter is printed on the instant ticket in an encrypted format, the ticket validation parameter being decrypted prior to creating the virtual ticket.

7. The method of claim 1 wherein the game data is obtained from a location remote from the instant ticket.

8. The method of claim 1 further comprising storing the game data at a remote location.

9. The method of claim 8 further comprising transmitting the validation data and the locations of the uncovered game indicia on the instant ticket to the remote location prior to creating the virtual ticket.

10. The method of claim 9 wherein the validation data and the locations of the uncovered game indicia on the instant ticket are transmitted over a network.

11. The method of claim 1 wherein the game information includes game parameters indicative of the game rule and game seeds for generating a pattern of game indicia corresponding to the relative positions of the game indicia printed on the instant ticket.

12. The method of claim 11 wherein the game seeds are stored in an encrypted format, the game seeds being decrypted prior to creating the virtual ticket.

13. A method of producing an instant ticket for playing a game, the game being played by uncovering a portion of game indicia printed on the instant ticket in accordance with a game rule, the method comprising:

providing ticket data relating to the instant ticket and game parameters indicative of the game rule;

calculating a ticket validation parameter based on the ticket data and the game parameters;

providing game seeds to generate a random selection of game indicia for the instant ticket;

calculating a pattern of game indicia indicative of the relative positions of the game indicia for the instant ticket based on the ticket data, the game parameters, the ticket validation parameter, and the game seeds; and

printing on the instant ticket the ticket validation parameter and the game indicia in accordance with the pattern of game indicia.

14. The method of claim 13 further comprising disposing an opaque, removable coating on the game indicia.

15. The method of claim 13 wherein the ticket validation parameter is printed on the instant ticket in a machine-readable format.

16. The method of claim 13 further comprising printing the ticket data on the ticket.

17. The method of claim 13 further comprising encrypting the ticket validation parameter prior to printing the ticket validation parameter on the instant ticket.

18. The method of claim 13 further comprising storing the game parameters and the game seeds.

19. The method of claim 18 wherein the game seeds are encrypted prior to storing the game parameters and the-game seeds.

20. The method of claim 13 further comprising transmitting the game parameters and the game seeds to a remote location.

21. The method of claim 20 wherein the game parameters and the game seeds are transmitted over a network.

22. Apparatus for validating an instant ticket for playing a game, the ticket having printed thereon validation data and game indicia, the game indicia being covered by an opaque, removable coating and a portion of the game indicia being uncovered in accordance with a game rule to play the game, the apparatus comprising: a ticket reader capable of reading the instant ticket to determine the validation data

and the relative positions of the uncovered game indicia on the instant ticket; and a host validation system for creating a virtual ticket corresponding to the instant ticket based on the validation data and game data stored at the host validation system, the host validation system further comparing the virtual ticket to the instant ticket to determine whether a winning combination of game indicia is uncovered on the instant ticket in accordance with the game rule.

23. Apparatus for producing an instant ticket for playing a game, the game being played by uncovering a portion of game indicia printed on the instant ticket in accordance with a game rule, the apparatus comprising:

a gaming authority for providing ticket data relating to the instant ticket and game parameters indicative of the game rule;

a processor capable of calculating a ticket validation parameter based on the ticket data and the game parameters; using game seeds to generate a random selection of game indicia for the instant ticket; and calculating a pattern of game indicia indicative of the relative positions of the game indicia for the instant ticket based on the ticket data, the game parameters, the ticket validation parameter, and the game seeds; and

a printer for printing on the instant ticket the ticket validation parameter and the game indicia in accordance with the pattern of game indicia.

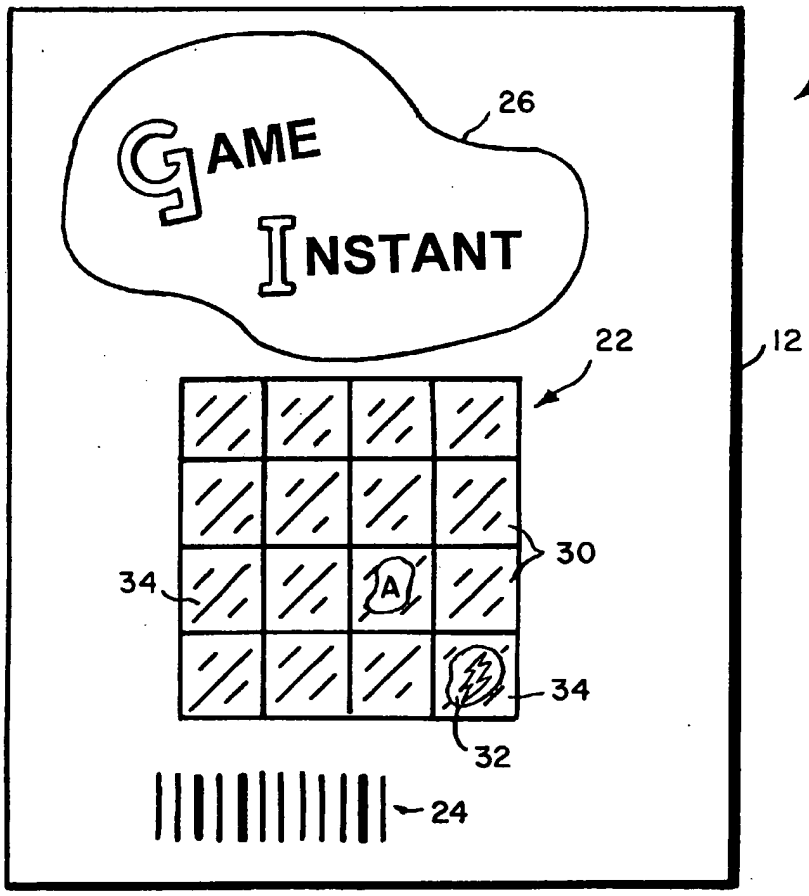

FIG. 1

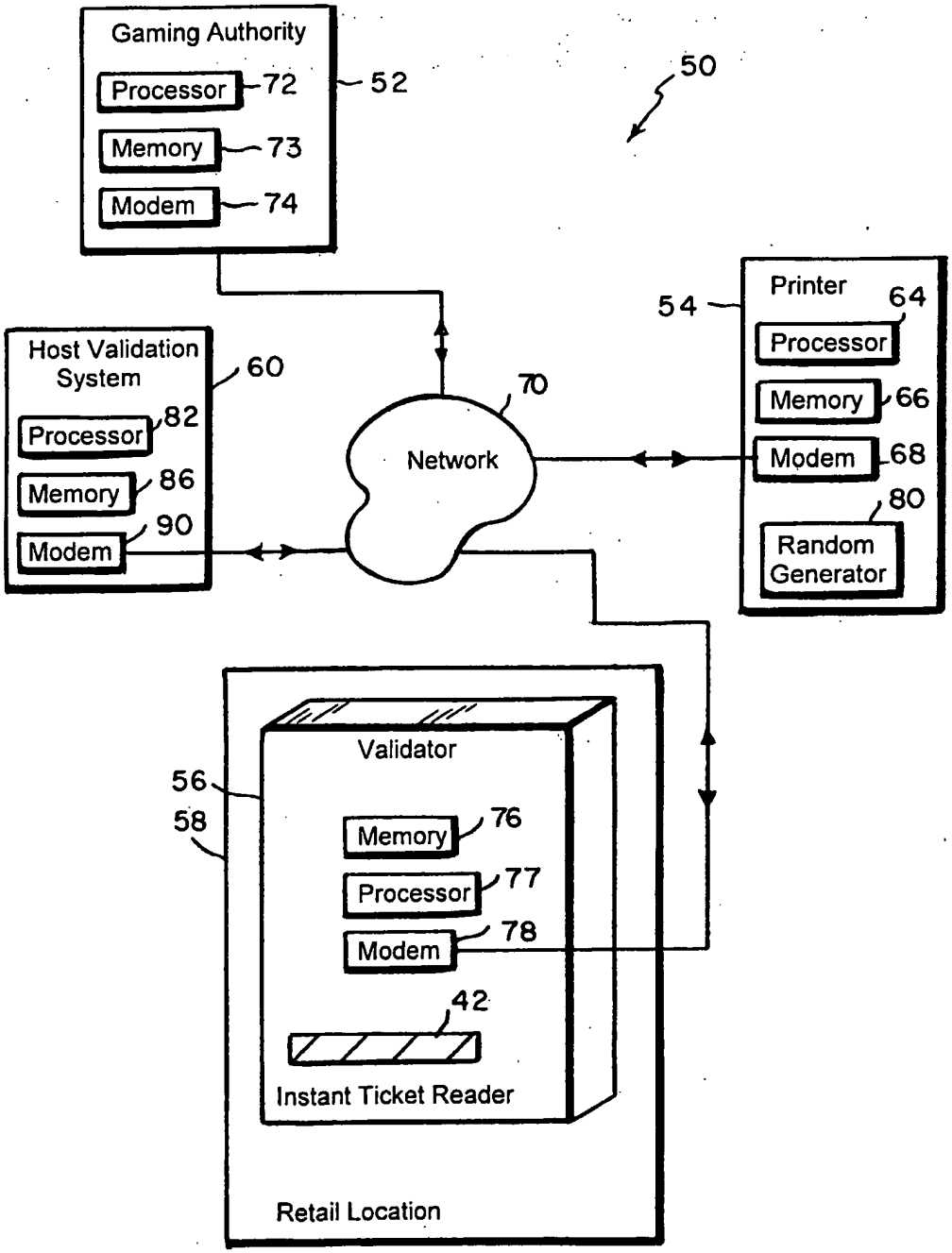
Gaming Authority
Processor
72
52
Memory
73
Modem
74
50
Printer
54
64
Processor
Memory
66
Modem
68
80
Random Generator
Host Validation System
60
Processor
82
Memory
86
Modem
90
70
Network
Validator
56
58
Memory
76
Processor
77
Modem
78
42
Instant Ticket Reader
Retail Location

FIG. 2

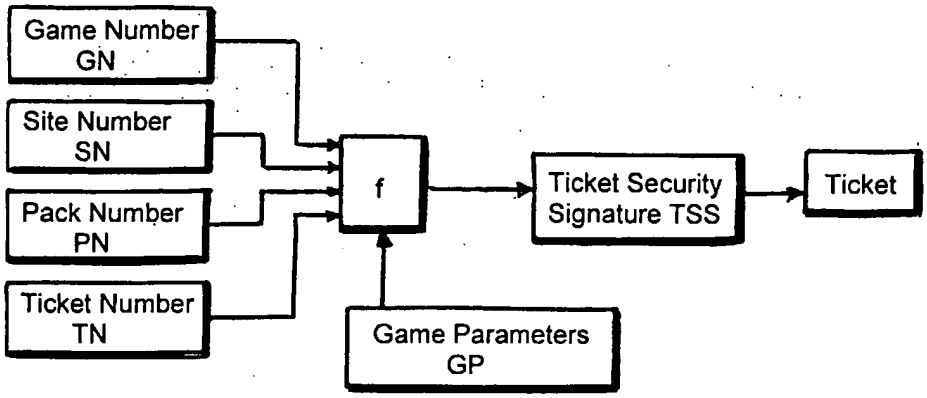
Game Number
GN
Site Number
SN
Pack Number
PN
Ticket Number
TN
f
Ticket Security
Signature TSS
Ticket
Game Parameters
GP

FIG. 3

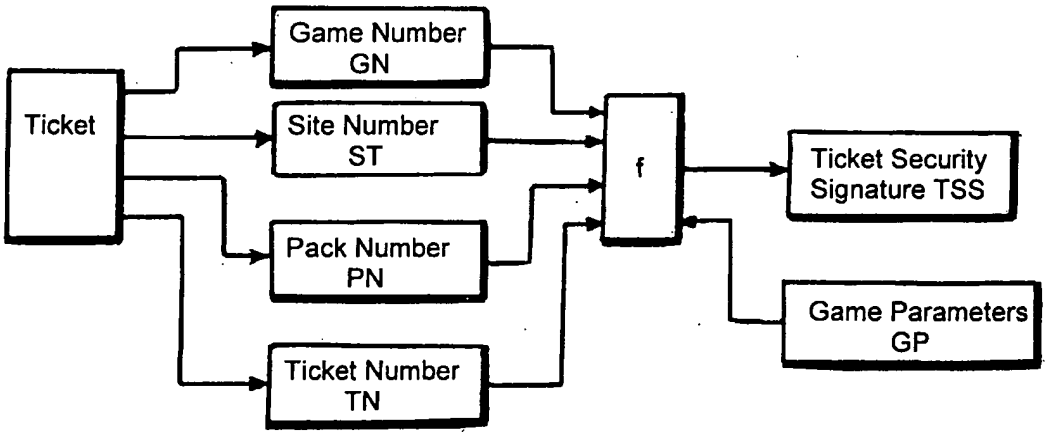
Ticket
Game Number
GN
Site Number
ST
Pack Number
PN
Ticket Number
TN
f
Ticket Security
Signature TSS
Game Parameters
GP

FIG. 4

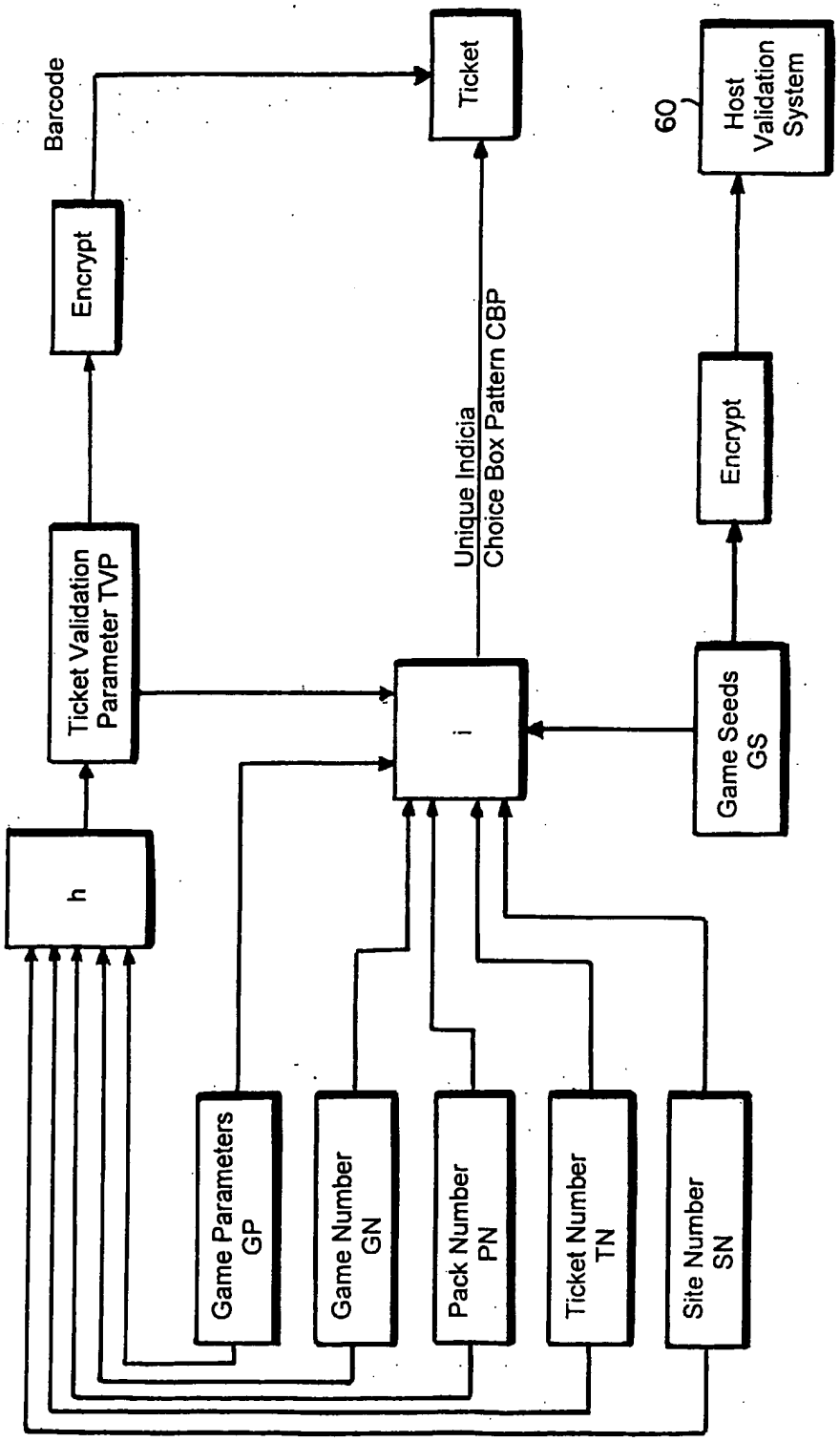
Barcode
Ticket
60
Host Validation System
Encrypt
Unique Indicia
Choice Box Pattern CBP
Encrypt
Ticket Validation Parameter TVP
i
Game Seeds GS
h
Game Parameters GP
Game Number GN
Pack Number PN
Ticket Number TN
Site Number SN

FIG. 5

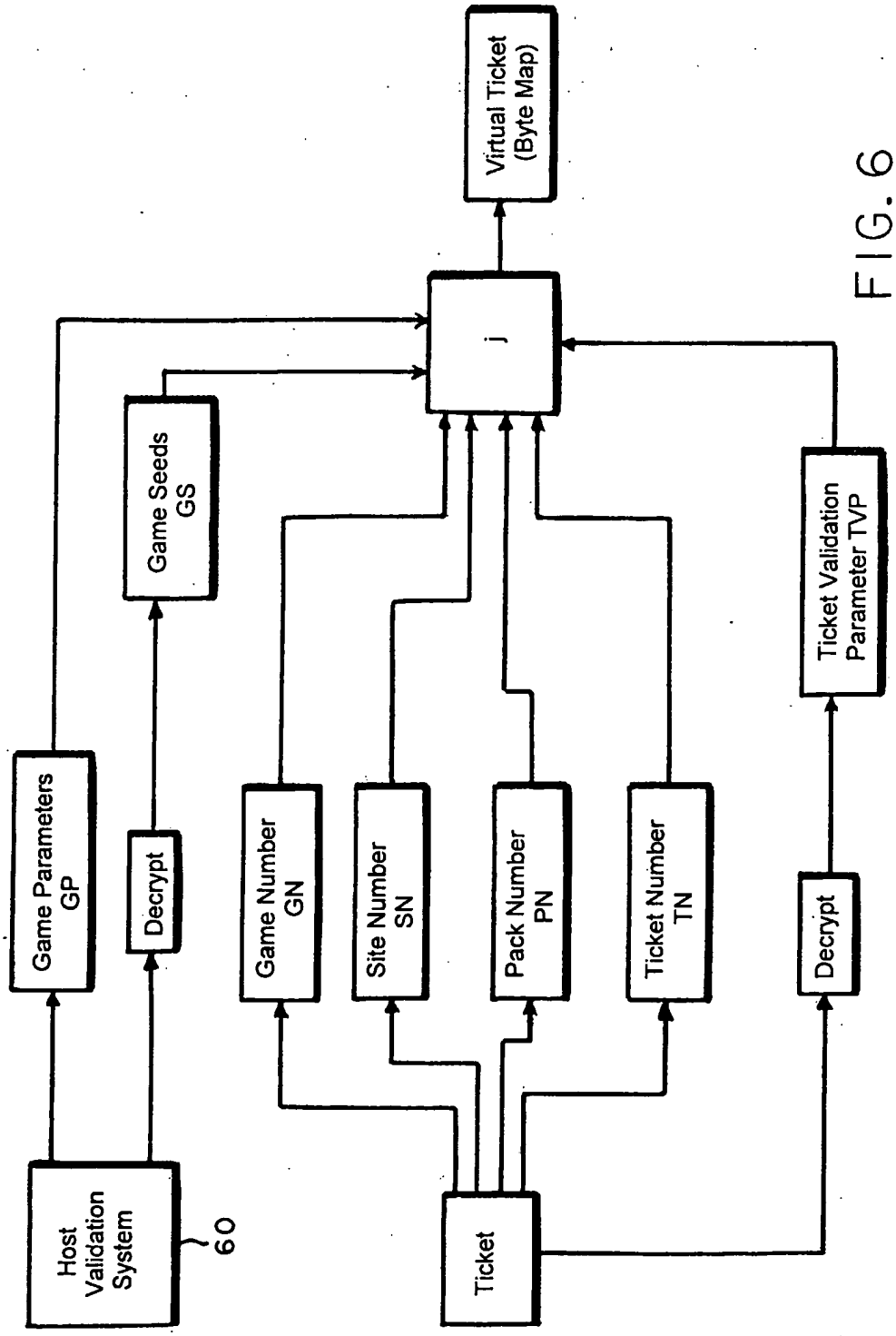
Virtual Ticket (Byte Map)
j
Game Seeds GS
Game Parameters GP
Decrypt
Game Number GN
Site Number SN
Pack Number PN
Ticket Number TN
Ticket Validation Parameter TVP
Decrypt
Host Validation System
60
Ticket

FIG. 6

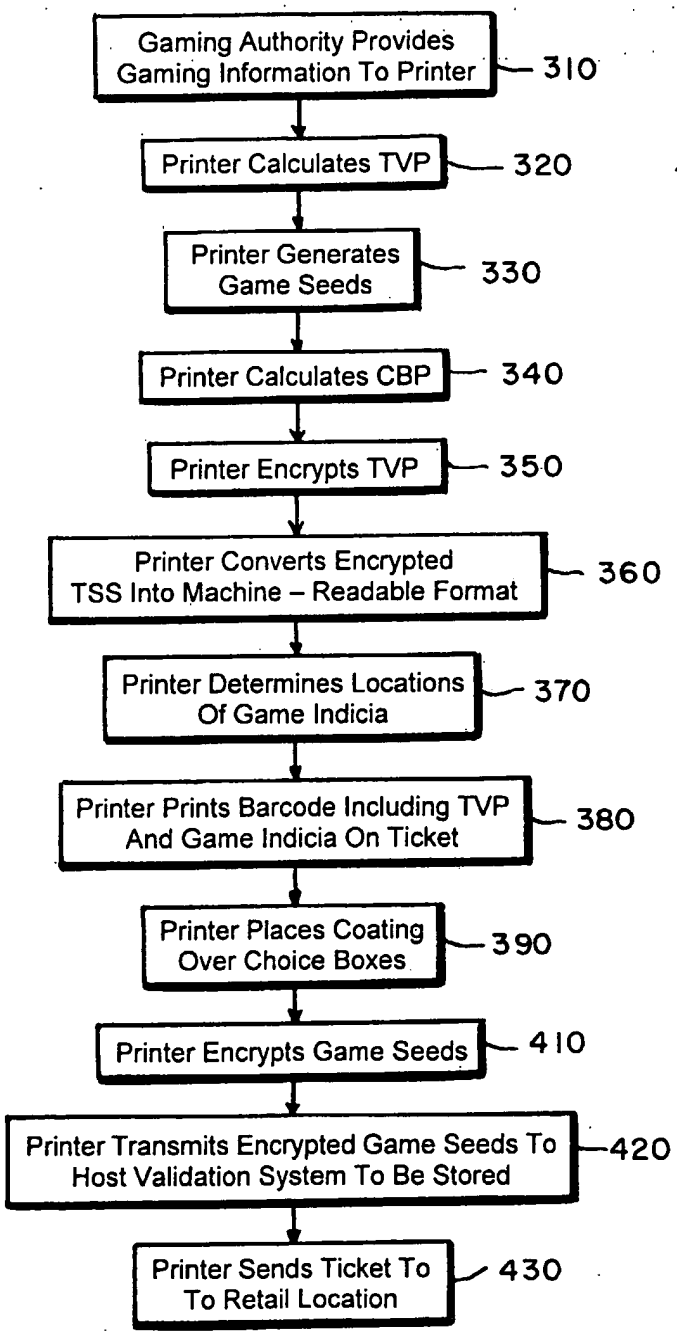
Gaming Authority Provides Gaming Information To Printer
310
300
Printer Calculates TVP
320
Printer Generates Game Seeds
330
Printer Calculates CBP
340
Printer Encrypts TVP
350
Printer Converts Encrypted TSS Into Machine – Readable Format
360
Printer Determines Locations Of Game Indicia
370
Printer Prints Barcode Including TVP And Game Indicia On Ticket
380
Printer Places Coating Over Choice Boxes
390
Printer Encrypts Game Seeds
410
Printer Transmits Encrypted Game Seeds To Host Validation System To Be Stored
420
Printer Sends Ticket To To Retail Location
430

FIG. 7

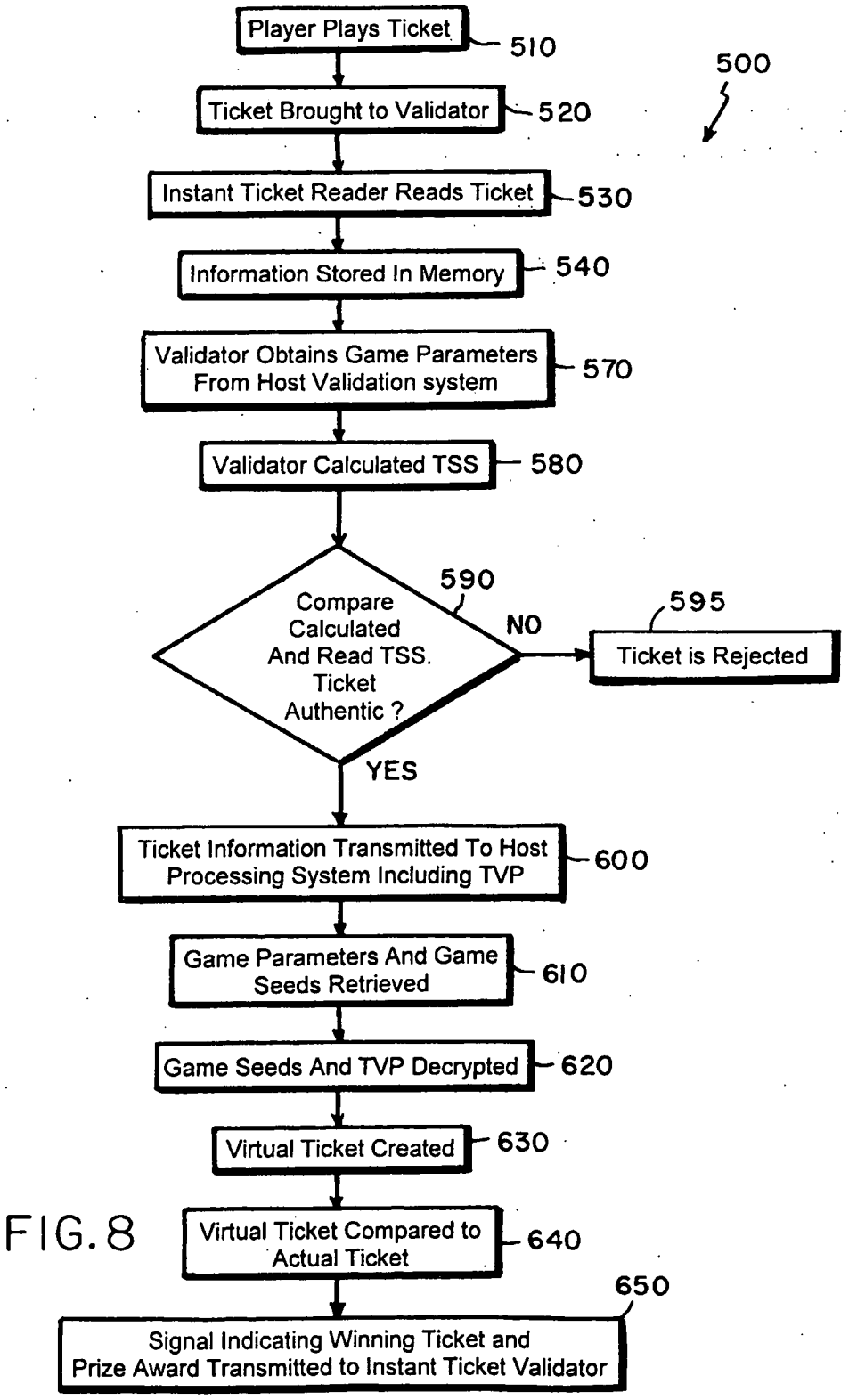
Player Plays Ticket
510
500
Ticket Brought to Validator
520
Instant Ticket Reader Reads Ticket
530
Information Stored In Memory
540
Validator Obtains Game Parameters From Host Validation system
570
Validator Calculated TSS
580
590
Compare Calculated And Read TSS. Ticket Authentic ?
NO
595
Ticket is Rejected
YES
Ticket Information Transmitted To Host Processing System Including TVP
600
Game Parameters And Game Seeds Retrieved
610
Game Seeds And TVP Decrypted
620
Virtual Ticket Created
630
Virtual Ticket Compared to Actual Ticket
640
650
Signal Indicating Winning Ticket and Prize Award Transmitted to Instant Ticket Validator

FIG. 8

INTERNATIONAL SEARCH REPORT

Intern... application No.
PCT/US01/12577

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A63F 13/00
US CL : 283/903

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 283/903,463/17, 235/375,463/29

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,935,000 A (SANCHEZ, III et al.) 10 August 1999 (08.10.1999).	1,2, 7, 8, 9,10,20,21,23,
X	US 4,677,553 A (ROBERTS et al.) 30 June 1987 (30.06.1987).	14,16,22
X	US 5,317,135 A (FINOCCHIO) 31 May 1994 (31.05.1994).	3,4,5,15,
X	US 6,030,288 A (DAVIS et al.) 29 February 2000 (29.02.2000).	11,12,13,17,18

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 June 2001 (14.06.2001)	06 JUL 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer James P. Trammell Telephone No. (703) 306-5484

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/12577

Continuation of B. FIELDS SEARCHED Item3: USPAT, US-PGPUB, EPO, JPO, DERWENT, IBM TDB search terms: instant ticket, validating, game, validation data, game indicia, opaque, removable coating, game rule, reading instant ticket, virtual ticket, winning combination, byte map format, machine-readable format, ticket validation parameter, encrypted format, decrypted, game data, storing data, remote location, transmitting data, uncovered game indicia, game seeds, pattern game indicia, ticket data, random selection of game indicia, removable coating, ticket reader, relative positions of uncovered game indicia, host validation system, gaming authority, processor, calculating ticket validation parameter.